ICSE 2025 EXAMINATION

Sample Question Paper – 1

Computer Applications

Time: 2 Hours **Max. Marks: 100**

General Instructions:

1. Answers to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during the first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. This Paper is divided into two Sections.
6. Attempt all questions from Section A and any four questions from Section B.
7. The intended marks for questions or parts of questions are given in brackets [ ].

SECTION A

Attempt all questions from this part.

QUESTION 1.
Choose the correct answer and write the correct option.

(Do not copy the question, write the correct answers only.)

(i) Which of the following is an incorrect way to declare an array?

(a) `int arr[ ] = new int[6]`
(b) `int[ ]arr = new int[6]`
(c) `int[ ]arr = new int[6]`
(d) `int arr[ ] = int[6] new`

Answer:

(d) `int arr[ ] = int[6] new`

(ii) What will be the error in the following Java code?

```
byte b = 50;
b = b*50;
```

(a) b cannot contain value 100, limited by its range.
(b) Operator has converted b*50 into int, which cannot be converted to byte without casting.

(c) b cannot contain value 50.
(d) No error in this code

Answer: (b) Operator has converted b*50 into int, which cannot be converted to byte without casting.

(iii) Array elements are always stored in ____memory locations.

(a) Binary search
(b) Random
(c) Sequential and random
(d) Sequential

Answer: (d) Sequential

(iv) Determine the output of the following statement.

```
String
a[]={"MI", "Samsung", "Micromax",
                          "One plus"};
System.out.println(a[3].length);
```

(a) 8
(b) 7
(c) 5
(d) 9

Answer: (a) 8

(v) Which operator is used to allocate memory for an array variable in Java?

(a) new
(b) alloc
(c) malloc
(d) None of these

Answer: (a) new

(vi) Which of the following is the superclass of the wrapper classes Double and Float?

(a) Number
(b) Digits
(c) Float
(d) Long

Answer: (a) Number

(vii) When does exceptions in Java arise in code sequence?

(a) Can occur any time
(b) Compilation time
(c) Run-time
(d) None of the above

Answer: (a) Can occur any time

(viii) What will be the output of the following code?

```
String s = "7";
int t = Integer.parseInt(s);
t=t+1000;
System.out.println(t);
```

(a) 1009 (b) 1000
(c) 1011 (d) 1007

Answer: (d) 1007

(ix) What is a necessary condition for automatic type conversion in Java?
(a) The destination type can be larger or smaller than source type.
(b) The destination type is larger than source type.
(c) The destination type is smaller than source type.
(d) None of the above

Answer: (a) The destination type can be larger or smaller than source type.

(x) _____means repetition of a set of statements, depending upon a condition test.
(a) Jump (b) Control
(c) Iteration (d) Selection

Answer: (c) Iteration

(xi) Can you declare an array without array size?
(a) Yes (b) No
(c) Depend on array size (d) Depend on array elements

Answer: (b) No

(xii) The get method is an example of which type of method?
(a) mutator method (b) accessors method
(c) class method (d) static method

Answer: (b) accessors method

(xiii) The class from which properties are inherited is called:
(a) sub class (b) derived class
(c) child class (d) base class

Answer: (d) base class

(xiv) Primitive types are passed through

(a) call by value
(b) call by reference
(c) Both (a) and (b)
(d) None of these

Answer: (d) None of these

(xv) A class can include fields and methods to represent the state and behavior of a/an ____.

(a) identifier
(b) variable
(c) token
(d) object

Answer: (d) object

(xvi) These data types are the data types defined by the language itself.

(a) Primitive
(b) Non-primitive
(c) Both (a) and (b)
(d) None of the above

Answer: (b) Non-primitive

(xvii) Assertion (A) : Primitive data types are the data types defined by the language itself.
Reason (R) : Class interface and array are the examples of primitive data types.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).
(c) Assertion (A) is true and Reason (R) is false.
(d) Assertion (A) is false and Reason (R) is true.

Answer: (c) Assertion (A) is true and Reason (R) is false.

(xviii) Read the following text and choose the correct answer:
Wrapper classes in Java allow primitive data types to be represented as objects. When an object of a wrapper class is created, a data field is established where the value of a primitive data type can be stored.

Wrapper class in Java is____.

(a) Create a new instance of the class
(b) Declare new classes called wrapper
(c) Used to encapsulate primitive data types
(d) None of the above

Answer: (a) Create a new instance of the class

(xix) Assertion (A) : Class is considered a primitive data type.
Reason (R) : A class is a user-defined data type, meaning it is created by the user.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A).
(c) Assertion (A) is true and Reason (R) is false.
(d) Assertion (A) is false and Reason (R) is true.

Answer: (d) Assertion (A) is false and Reason (R) is true.

(xx) It is also referred to as a desktop or window-based application.
(a) Package
(b) Java Applet
(c) Servlet
(d) Stand-alone application

Answer: (d) Stand-alone application

QUESTION 2.

(i) Observe the following class.

```
public class Myclass
{
  public static int
       a=4, b=5, c=6;
  public int x=2, y=3;
}
```

Identify the variables for which each object of the class will have its own unique copy.

Answer: x and y

(ii) What will the following code output?

```
String s = new String
                    ("Abhishek");
System.out.println(s.toUpperCase());
```

Answer:
Output
ABHISHEK

(iii) What is the output of the following code ?

```
double x = 3.7, y = 3.3;
System.out.println(Math.min(Math.
                        floor(x), y));
System.out.println(Math.max(Math.
                        ceil(x), y));
```

Answer:

Output
3.3
4.0

(iv) Write the Java statement for the given mathematical expression:

$$d = \frac{\sqrt{3x + x^2}}{a + b}$$

Answer:

```
double d=(Math.sqrt(3*x+x*x))/(a+b);
```

(v) Define the charAt() function.

Answer: The charAt() function is a method in various programming languages, including Java and JavaScript, that is used to access a specific character within a string based on its index position. It takes an integer argument representing the index and returns the character at that position.

(vi) State the number of bytes occupied by char and int data types.

Answer: The number of bytes occupied by char and int data types typically depends on the system architecture and the compiler being used. However, the most common sizes are:

- char: 1 byte (8 bits)
- int: 4 bytes (32 bits) on most modern systems, though this can vary (e.g., on some 16-bit systems, int may be 2 bytes, and on some 64-bit systems, it can still be 4 bytes).

(vii) What will be the output of following code snippet,

```
int n = 300, a = 200;
if(a + n * 10 > 5000)
    System.out.println("100");
else
    System.out.println("200");
```

Answer:

Output

200

(viii) State the values of num and chr :

```
char ch = 'C';
int num = ch + 3;
char chr = (char) num;
```

Answer: The value of

num = 70

chr = F

(ix) Write the output of the following code in Java.

```
int x = 0;
while (x <= 3) {
    System.out.println(x);
    x = x + 1;
}
```

Answer:

Output

0

1

2

3

(x) Rewrite the following code using while loop.

```
int a= 100;
for(int b=2; b<=30; b=b+5)
{
  System.out.println("\n"+(b+a));
  a=a-2;
}
```

Answer:

```
int a = 100;
int b = 2;

while (b <= 30) {
    System.out.println("\n" + (b + a));
    a = a - 2;
    b = b + 5;
}
```

SECTION B

Attempt any four questions from this section.

QUESTION 3.

A special number is defined as a number where the sum of the factorials of each digit equals the number itself.

e.g. 145 = 1! + 4 ! + 5! =1 + 24 + 120

Design a class Special to determine if a given number is a special number or not

Answer:

```java
public class Special {
    public static boolean isSpecialNumber(int number) {
        int originalNumber = number;
        int sumFactorials = 0;

        while (number > 0) {
            int digit = number % 10;
            sumFactorials += factorial(digit);
            number /= 10;
        }

        return sumFactorials == originalNumber;
    }

    private static int factorial(int n) {
        if (n == 0) {
            return 1;
        } else {
            return n * factorial(n - 1);
        }
    }

    public static void main(String[] args) {
        int number = 145;
        if (isSpecialNumber(number)) {
            System.out.println(number + " is a special number.");
        } else {
            System.out.println(number + " is not a special number.");
        }
    }
}
```

QUESTION 4.

Write a Java program that prompts the user to enter the size and elements of an array. Then, ask the user to enter a number to insert and specify the index position where they want to insert the desired element in the array.

Answer:

```java
import java.util.Scanner;

public class InsertElementInArray {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter the size of the array: ");
        int size = scanner.nextInt();

        int[] array = new int[size];

        System.out.println("Enter the elements of the array:");
        for (int i = 0; i < size; i++) {
            array[i] = scanner.nextInt();
        }

        System.out.print("Enter the number to insert: ");
        int numberToInsert = scanner.nextInt();

        System.out.print("Enter the index position to insert: ");
        int indexToInsert = scanner.nextInt();
```

```java
// Check if the index is valid
if (indexToInsert < 0 || indexToInsert > size) {
    System.out.println("Invalid index position. Please enter a
    return;
}
```

```
valid index within the array bounds.");
```

```java
        // Create a new array with one extra space
        int[] newArray = new int[size + 1];

        // Copy elements from the original array to the new array
        for (int i = 0; i < indexToInsert; i++) {
            newArray[i] = array[i];
        }

        // Insert the new element at the specified index
        newArray[indexToInsert] = numberToInsert;
```

```java
// Copy the remaining elements from the original array to the
for (int i = indexToInsert; i < size; i++) {
    newArray[i + 1] = array[i];
}
```

```
new array
```

```
        System.out.println("Array after insertion:");
        for (int i = 0; i < size + 1; i++) {
            System.out.print(newArray[i] + " ");
        }
    }
}
```

QUESTION 5.

Write a menu-driven program using a switch statement.

(i) To print the Floyd's triangle

```
1
2  3
4  5  6
7  8  9  10
11  12  13  14  15
```

(ii) To print the Pascal triangle

```
      1
    1   1
   1  2  1
  1  3  3  1
 1  4  6  4  1
```

Answer:

(i)

```
import java.io.*;
import java.util.*;

public class FloydsTriangle {
    public static void main(String[]
args) throws IOException {
        InputStreamReader IR = new
InputStreamReader(System.in);
            BufferedReader br = new
BufferedReader(IR);
```

```
          System.out.println("Choose
the correct option:");
          System.out.println("1. To
print Floyd's Triangle...");
          System.out.println("2. To
print Pascal's Triangle...");

       int ch = Integer.parseInt(br.
readLine());

        switch (ch) {
            case 1:
              printFloydsTriangle();
                break;
            case 2:
             printPascalsTriangle();
                break;
            default:
           System.out.println("Wrong
choice");
        }
    }
             public   static   void
printFloydsTriangle() {

      Scanner sc = new Scanner(System.
 in);
        System.out.println("How many
 rows do you want in this pattern?");
        int rows = sc.nextInt();
        int k = 1;
         System.out.println("Here is
 your pattern...!!!");

         for (int i = 1; i <= rows;
 i++) {
             for (int j = 1; j <= i;
 j++) {
```

```
                System.out.print(k +
" ");
                k++;
            }
            System.out.println();
        }
        sc.close();
    }
}
```

(ii)

```
import java.util.Scanner;

public class PascalsTriangle {

            public   static   void
printPascalsTriangle() {
     Scanner sc = new Scanner(System.
in);
        System.out.println("How many
rows do you want in this pattern?");
        int rows = sc.nextInt();

          for (int i = 0; i < rows;
i++) {
              for (int j = rows; j >
i; j--) {
               System.out.print(" ");
            }

            int temp = 1;
             for (int k = 0; k <= i;
k++) {
                System.out.print(temp
+ " ");
                temp = temp * (i - k)
/ (k + 1);
            }
            System.out.println();
        }

         sc.close();
    }
}
```

QUESTION 6.

Write a Java program to print following patterns using switch case:

(i)
```
5 4 3 2 1
5 4 3 2
5 4 3
5 4
5
```

(ii)
```
A A A A A
B B B B
C C C
D D
E
```

Answer:

```
import java.util.Scanner;

public class PatternPrinting {

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the pattern number (1 or 2): ");
        int patternNumber = scanner.nextInt();
        scanner.close();

        switch (patternNumber) {
            case 1:
                printPattern1();
                break;
            case 2:
                printPattern2();
                break;
            default:
                System.out.println("Invalid pattern number.");
        }
    }
```

```
    private static void printPattern1() {
        for (int i = 5; i >= 1; i--) {
            for (int j = i; j >= 1; j--) {
                System.out.print(j);
            }
            System.out.println();
        }
    }
```

```
    private static void printPattern2() {
        char ch = 'A';
        for (int i = 5; i >= 1; i--) {
            for (int j = 1; j <= i; j++) {
                System.out.print(ch);
            }
            System.out.println();
            ch++;
        }
    }
}
```

QUESTION 7.

Write a Java program which entered a string by user and count the occurrence of number of characters present in the string.

e.g. Input String HELLO

Output

The character E has occurred for 1 time

The character H has occurred for 1 time

The character L has occurred for 2 times

The character O has occurred for 1 times

Answer:

```
import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;

public class CharacterCount {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a string: ");
        String inputString = scanner.nextLine();

        // Create a HashMap to store character frequencies
        Map<Character, Integer> charCountMap = new HashMap<>();

        // Iterate through each character in the string
        for (char ch : inputString.toCharArray()) {
            charCountMap.put(ch, charCountMap.getOrDefault(ch, 0) + 1);
        }
```

```
// Print the character frequencies
for (Map.Entry<Character, Integer> entry
    System.out.println("The character " +
}
```

```
: charCountMap.entrySet()) {
+ entry.getKey() + " has occurred for " + entry.getValue() + " times");
```

```
        }

        scanner.close();
    }
}
```

QUESTION 8.

Write a program to accept a string. Convert the string to uppercase. Count and output the number of double letter sequences that exist in the string.

e.g. Input : Aarav will buy a ball and bat tomorrow

Output : 4

Answer:

```
import java.util.Scanner;

public class DoubleLetterCount {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter a string: ");
        String inputString = scanner.nextLine();

        // Convert the string to uppercase
        String uppercaseString = inputString.toUpperCase();

        // Initialize a counter to track double letter sequences
        int doubleLetterCount = 0;
```

```
// Iterate through the characters of the string, comparing adjacent
for (int i = 0; i < uppercaseString.length() - 1; i++) {
    if (uppercaseString.charAt(i) == uppercaseString.charAt(i + 1))
        doubleLetterCount++;
    }
}
```

```
pairs

{
```

```
        System.out.println("Number of double letter sequences: " +
    }
}
```

```
doubleLetterCount);
```